Lattice boltzmann numerical prediction of flow behavior downstream of cylinder blockage at various Reynolds numbers

Abstract

This paper presents numerical results of flow behavior downstream of cylinder blockage at various Reynolds numbers. The lattice Boltzmann method, a numerical scheme based on mesoscopic approach has been used as a computational tool to study the vortices formation downstream of the cylinder. In this study, three different types of blockage are located inside a channel and the effect of the shape of blockage on the flow behavior downstream of cylinder at various Reynolds number is investigated extensively. Comparisons of detailed flow pattern for every case via streamline and length of vortices have been carried out. The ability of the lattice Boltzmann numerical scheme to simulate complicated flow phenomena is demonstrated.